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| xxsmall | **Monte Sant' Angelo Mercy College**  **Year 9 Mathematics**  **ASSESSMENT: GLOBAL WARMING AND DISAPPEARING RAINFORESTS**  **Pathway A and B** | Worldschool-black-small |

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| **NAME** |  | **CLASS** |  | **DATE** |  |

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| **You will be assessed on the following criteria:** | | |
| Criteria C : Communication in Mathematics (max 6) | ***Your level:*** |  |
| Criteria D: Reflection in Mathematics (max 6) | ***Your level:*** |  |

**To obtain the highest level for each of the following criteria you will need to do the following:**

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| **Criteria** | Level | **Descriptors** | **Indicators** |
| ***Criterion C***  **Communication in Mathematics** | **1 – 2** | The student shows **basic** use of mathematical language **and/or** forms of mathematical representation. The lines of reasoning are **difficult to follow**. | * Estimates fraction and percentage of forest from graph.(b), (c) * Determines the shape and calculates the area of the school from a given map (i) |
| **3 – 4** | The student shows **sufficient** use of mathematical language **and** forms of mathematical representation. The lines of reasoning are **clear** though not always **logical** or **complete**.  The student moves between different forms of representation **with some success.** | * Clearly interprets facts from graph using mathematical language. (d) * Finds the increase (f) * Extends original table to include data for 2000-2050. (g) * Extends the graph according to the calculations (h) * Graphs 15 million ha from 2000, on graph in different colour. (m – *i* ) * Predicts when rainforests will disappear from graph drawn. (m – *ii* ) * Attempts to list differences between the two graphs (m – *iii* ) |
| **5 – 6** | The student shows **good** use of mathematical language **and** forms of mathematical representation. The lines of reasoning are **concise, logical** and **complete**.  The student moves **effectively** between different forms of representation. | * Describes differences between the two graphs   (m – *iii* )   * Uses good mathematical language in reasoning and explanations in a concise and logical way throughout the paper (correctness of calculations and graphs required to achieve level 6) |

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| **Criteria** | Level | **Descriptors** | **Indicators** |
| ***Criterion D***  ***Reflection in Mathematics*** | **1 – 2** | The student **attempts** to explain whether his or her results make sense in the context of the problem. The student **attempts to describe** the importance of his or her findings in connection to real life. | * Explains the process used to predict 2050 area and percentage change. (g) * Attempts to describe process to calculate the area of the school.(j) |
| **3 – 4** | The student **correctly but briefly explains** whether his or her results make sense in the context of the problem and **describes** the importance of his or her findings in connection to real life.  The student **attempts** to justify the degree of accuracy of his or her results where appropriate. | * Describes an assumption being made in predicting change. (g) * Describes processes used to calculate the area of the school. (j) * Relates maths to forests in (k) * Describes the importance of findings (l) |
| **5 – 6** | The student **critically explains** whether his or her results make sense in the context of the problems and provides a **detailed explanation** of the importance of his or her findings in connection to real life.  The student **justifies** the degree of accuracy of his or her results where appropriate.  The student **suggests improvements** to the method when necessary. | * Article identifies concerns but importance of conclusions not stated clearly.(Part C) * Article clearly critical of facts in context and is concise and relevant. (Part C) |

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Date handed out : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Date due: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Year 9 Mathematics**

**Criteria C and D Take-home task**

**GLOBAL WARMING and DISAPPEARING RAINFORESTS**

Area of interaction: Environment

**Academic honesty: Academic honesty is fundamental to the ethos of the College and is in keeping with the Mercy philosophy of Human Dignity and Justice. It is expected that all of this task will be your own work. You should not be receiving help from a parent, tutor or other student. It should be all your own independent work.**

**Instructions:**

**All your working should be shown in the spaces given. For Part C, you can access the document on Montenet and insert a formatted article or you can submit it separately noting your name and class. You are encouraged to submit a well edited article.**

**Questions that will show your achievement of Criterion C and D are indicated on the sheet of Descriptors and Indicators.**

**Conversions that you might find useful:**

**There are:**

* **\_\_\_\_\_\_ mm in one cm**
* **\_\_\_\_\_\_ mL in one litre**
* **\_\_\_\_\_\_ hours in one day**
* **\_\_\_\_\_\_ square mm in one square cm**
* **\_\_\_\_\_\_ square cm in one square metre**
* **\_\_\_\_\_\_ square metres in one hectare (Ha).**

**GLOBAL WARMING and DISAPPEARING RAINFORESTS**

Area of interaction: Environment

Here are some interesting facts about our planet.

RAINFORESTS:

* Rainforests cover less than 2% of the Earth’s total surface area.
* Rainforests exist on every continent except Antarctica.
* Rainforests act as the Earth’s thermostat by regulating temperatures and weather patterns.
* Rainforests are critical in maintaining the Earth’s limited supply of drinking and fresh water.
* Originally, there were 1.55 x 107 square kilometres of tropical rainforests. As a result of deforestation, only 6.73 x 106 square kilometres of rainforests remain.
* A slice of rainforest the size of a football field (5930 m2) is destroyed somewhere in the world every second.

**Do we need to be concerned about the rate at which rainforests are disappearing?**

**Part A: Loss of forest**

We are just beginning to appreciate the huge biological value and diversity of the rainforest. Is it too late?

This line graph shows the millions of hectares of rainforest in the world over the last two centuries.



1. Complete the table below by estimating values from the graph:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Year | 1800 | 1850 | 1900 | 1950 | 2000 |
| Rainforest Area (in millions of hectares) | 2900 |  |  |  |  |

1. In the year 1800, 2900 million hectares of rainforest existed. Estimate what fraction of this rainforest had been destroyed in the next 200 years.
2. Write the fraction found in b. as a percentage.
3. What other mathematical fact or facts can you interpret from the graph on page 3?

(Choose from words like *increasing, decreasing, rate, faster, slower, than* in your

answer and use a number fact.)

1. Using the graph, complete the 2nd column below for 1950 to 2000

|  |  |  |  |
| --- | --- | --- | --- |
| Year | 1900-1950 | 1950-2000 | 2000-2050 |
| Decrease in Rainforest Area | 200 |  |  |
| Percentage decrease from previous year |  |  |  |

1. How many times greater was the percentage decrease of rainforest from 1950-2000 than from 1900-1950?
2. Describe how you would find the area of the rainforest in 2050 if the decrease of rainforest continues in the manner found in the previous section.

Also, find the predicted area of rainforest left in 2050 and explain your calculations. Add this information to the table above.

What assumptions have you made in making this prediction?

1. Add your prediction and extend the graph on page 3.

**Part B**

*Originally, there were 1.55* x *107 square kilometres of tropical rainforests. As a result of deforestation, only 6.73* x *106 square kilometres of rainforests remain.*

*A slice of rainforest the size of a football field (5930 m2) is destroyed somewhere in the world every second.*

1. Here is a scale drawing of the block which contains our school. Use the scale given to calculate the area of this block in square metres.

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1. Describe the process you used to calculate this area.
2. Using the data at the start of Part B, compare the area of the school to the area of rainforest destroyed each day.
3. By considering how long our forests will last, reflect on your finding so far.
4. Some experts believe the rate of deforestation is in fact 15 million hectares per year.
5. Graph this information on your graph on page 3 from the year 2000 using a different coloured pen than you used in part (h).

ii. From your graph in i), predict when our forests will disappear.

iii. Explain why the two graphs are different? Justify your answer using mathematical terminology and notation.

**Part C**

Write a 150-word article for a magazine that is popular with teenagers about the decreasing size of the world’s rainforests. Make sure your article has a headline, introduction, body of the investigation and conclusion. You should also include your reflection based on the finding within this paper.

Make sure you use proper mathematical terminology and notation as well as give explanation, justification and suggestions for improvements.

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